REMARKS

In an Office Action mailed on January 28, 2004, objections were made to the drawings; claims 4, 8, 9, 18, 19, 28 and 29 were rejected under 35 U.S.C. § 112, first paragraph; claims 1-30 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite; claims 1-7, 9-17, 19-27, 29 and 30 were rejected under 35 U.S.C. § 102(e) as being anticipated by van Nee; and claims 8, 18 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over van Nee in view of Bohnke. For purposes of overcoming the objections to the drawings, annotated and clean versions of Figure 1 are being submitted with this Reply. Because reference numerals 11, 13, 14, 20, 31, 33 and 35 are now labeled in Figure 1, withdrawal of the objections to the drawings is requested. The § 112, first paragraph rejections; the § 112, second paragraph rejections; and the §§ 102 and 103 rejections are discussed below.

§ 112, First Paragraph Rejections:

Claim 4 was rejected under the first paragraph of Section 112 because the specification allegedly does not enable one skilled in the art to apply a weighting function during a discrete frequency transformation to perform symbol shaping. However, the specification describes at least one embodiment of claim 4. For example, in lines 6-16 on page 9 of the specification, the specification describes symbol shaping by applying a weighting function, such as a Raised-Cosine function. Furthermore, in lines 23-25 on page 9, the specification describes that the phrase "discrete frequency transformation" may mean either a discrete frequency transformation (DFT) or an inverse discrete frequency transformation (IDFT). Thus, the discussion in lines 6-16 on page 9, referring to the symbol shaping by the IDFT engine 14, discusses at least one embodiment of the symbol shaping that is set forth in claim 4. Therefore, withdrawal of the § 112, first paragraph rejection of claim 4 is requested.

Claims 8, 18 and 28 were also rejected under the first paragraph of Section 112. Each of these claims recite the transmission of a symbol during an interval that exceeds a symbol generation interval. Contrary to the § 112, first paragraph rejections the specification describes at least one embodiment that falls within the scope of these claims. For example, the specification in lines 27-31 on page 7 and extending through lines 1-11 on page 8 describes the creation of a cyclic extension by the IDFT engine 14. Thus, it is submitted that this discussion provides support for claims 8, 18 and 28.

Claims 9, 19 and 29 were also rejected under the first paragraph of Section 112. However, contrary to these rejections, the specification describes at least one embodiment that supports these claims. For example, in lines 26-30 on page 8 of the specification, the specification describes the generation of a cyclic prefix by the IDFT engine 14. Therefore, withdrawal of the § 112, first paragraph rejections of claims 9, 19 and 29 is requested.

It is noted that in the discussion of the § 112, first paragraph rejections above, references were made to various portions of the specification. It is noted that the claims are not be construed to be limited to these specific embodiments referenced in this discussion, but rather, the cited language provides only a few out of many possible embodiments that fall within the scope of the claim language.

§ 112, Second Paragraph Rejections:

The second paragraph of 35 U.S.C. § 112 sets forth two requirements: a.) the claims must set forth the subject matter that applicants regard as their invention; and b.) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant. M.P.E.P. § 2171.

The Examiner rejects claims 1, 14, 11, 18, 21 and 24 under 35 U.S.C. § 112, second paragraph without providing a proper basis for any of these rejections. In this manner, the rejections fail to show why any of the two requirements that are set forth above have not been satisfied.

For example, in the rejections of claims 1, 11 and 21, the Examiner contends that the phrase "discrete frequency transformation" is unclear because it is not described in the specification or is well known in the art. The Examiner appears to be basing the § 112, second paragraph rejections on alleged enablement problems. However, an alleged enablement problem is not a proper basis for a § 112, second paragraph rejection. It is noted that claims 1, 11 and 21 satisfy the enablement requirement set forth in the first paragraph of § 112 as the specification describes numerous discrete frequency transformations (DFTs) and inverse discrete frequency transformations (IDFTs). Furthermore, in lines 23-25 on page 9 of the specification, the specification states, "thus, the term 'discrete frequency transformation' as used in the context of this application, may mean either a discrete frequency transformation (DFT) or an inverse discrete frequency transformation (IDFT)." Thus, not only are the DFT and IDFT

transformations described in the specification embodiments of a "discrete frequency transformation," the specification further clarifies that both IDFT and DFT transformations are embodiments of discrete frequency transformations. Thus, there also appears to be no basis for § 112, first paragraph rejections of claims 1, 11 and 21.

Likewise, claims 14 and 24 were rejected under the second paragraph of Second 112 because the "components of DFT" were allegedly not described in the specification or well known in the art. Once again, this is not a proper basis for a § 112, second paragraph rejection. Instead, it appears the Examiner is somehow rejecting the claims for allegedly not being enabled and therefore failing to comply with the first paragraph of § 112. However, the specification clearly sets forth support for the components of the discrete frequency transformation that appear in claims 14 and 24. For example, in Figure 5 and the associated text of the specification, the computation of components of an IDFT is discussed. As stated above, an IDFT is one embodiment of a "discrete frequency transformation." Therefore, there is no basis for § 112, first paragraph or second paragraph rejections of these claims.

Claim 18 has been amended to correct the antecedent basis problem and therefore overcome the § 112, second paragraph rejection of this claim.

Thus, because the Examiner fails to set forth proper bases for the § 112, second paragraph rejections of claims 1, 11, 14, 21 and 24, withdrawal of the § 112 rejections is requested.

§§ 102 and 103 Rejections of Claims 1-10:

The method of independent claim 1 includes basing a discrete frequency transformation on the number of subcarriers in a predetermined set of subcarriers. Furthermore, the method of independent claim 1 includes excluding from the transformation mathematical operations that are associated with subcarriers that are not assigned to modulate the data.

Contrary to the limitations of independent claim 1, van Nee teaches that the dynamic control circuitry 15 may perform an N-point IFFT. Furthermore, van Nee teaches that the circuitry 15 can perform an X-point IFFT, where X is less than the number (N) of subcarriers. *See, for example*, van Nee, 6:10-23. However, this cited language does not teach or suggest all of the limitations of independent claim 1.

More specifically, there is no teaching or even a suggestion in van Nee of excluding from a discrete frequency transformation, mathematical operations that are associated with subcarriers that are assigned to modulate data. Although van Nee describes an X-point IFFT, this FFT is based on X number of subcarriers (a number less than N), not on the N number of subcarriers. Thus, there is no exclusion of mathematical operations that is explicit or implicit from language that states that an X-point IFFT is being performed rather than an N-point FFT. In this manner, if the X-point IFFT were excluding mathematical operations associated with subcarriers not assigned to modulate data, then van Nee would describe this exclusion with respect to the X subcarriers. However, van Nee fails to teach or suggest such an exclusion and thus, fails to teach or even suggest all of the limitations of independent claim 1. Although van Nee describes leaving some input values in the IDFT transformation zero (van Nee 4:55-57), van Nee does not describe that the mathematical operations associated with these input values are excluded from the IFFT.

Claims 2-10 are patentable for at least the reason that these claims depend from an allowable claim. Therefore, for at least the reasons set forth above, withdrawal of the §§ 102 and 103 rejections of claims 1-10 is requested.

§§ 102 and 103 Rejections of Claims 11-20:

The system of independent claim 11 includes a transmitter to base a discrete frequency transformation on the number of subcarriers in a predetermined set of subcarriers. Furthermore, the transmitter excludes from the transformation mathematical operations that are associated with subcarriers that are not assigned to modulate data.

Contrary to the limitations of independent claim 11, van Nee neither teaches nor suggests a transmitter to base a discrete frequency transformation on the number of subcarriers and exclude from the transformation mathematical operations that are associated with the subcarriers that are not assigned to modulate data. Instead, van Nee merely discloses an X-point IFFT instead of an N-point IFFT. This disclosure does not, however, teach or suggest the exclusion of mathematical operations from the X-point FFT that are associated with subcarriers that are not assigned to modulate data. Although van Nee describes leaving some input values in the IDFT transformation zero (van Nee 4:55-57), van Nee does not describe that the mathematical operations associated with these input values are excluded from the IFFT.

Claims 12-20 are patentable for at least the reason that these claims depend from an allowable claim. Thus, for at least the reasons set forth above, withdrawal of the §§ 102 and 103 rejections of claims 11-20 is requested.

§§ 102 and 103 Rejections of Claims 21-30:

The article of claim 21 includes a storage medium that is readable by a processor-based system. The storage medium stores instructions to cause a processor to base a discrete frequency transformation of the number of subcarriers in a predetermined set of subcarriers. Furthermore, the instructions cause the processor to exclude from the transformation mathematical operations that are associated with the subcarriers that are not assigned to modulate data.

Contrary to the limitations of independent claim 21, van Nee fails to teach or suggest instructions to cause a processor to exclude from transformation mathematical operations that are associated with subcarriers not assigned to modulate data. The mere disclosure of an X-point IFFT (based on X subcarriers less than the full set of N subcarriers) versus an N-point FFT does not teach or even suggest this exclusion. Although van Nee describes leaving some input values in the IDFT transformation zero (van Nee 4:55-57), van Nee does not describe that the mathematical operations associated with these input values are excluded from the IFFT. Thus, for at least these reasons, van Nee fails to teach the limitations of independent claim 21.
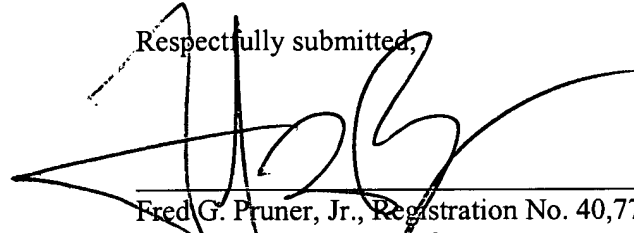
Claims 22-30 are patentable for at least the reason that these claims depend from an allowable claim. Therefore, for at least the reasons set forth above, withdrawal of the §§ 102 and 103 rejections of claims 21-30 is requested.

CONCLUSION

In view of the foregoing, withdrawal of the §§ 102, 103 and 112 rejections and a favorable action in form of a Notice of Allowance are requested. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 20-1504 (ITL.0548US).

Respectfully submitted,

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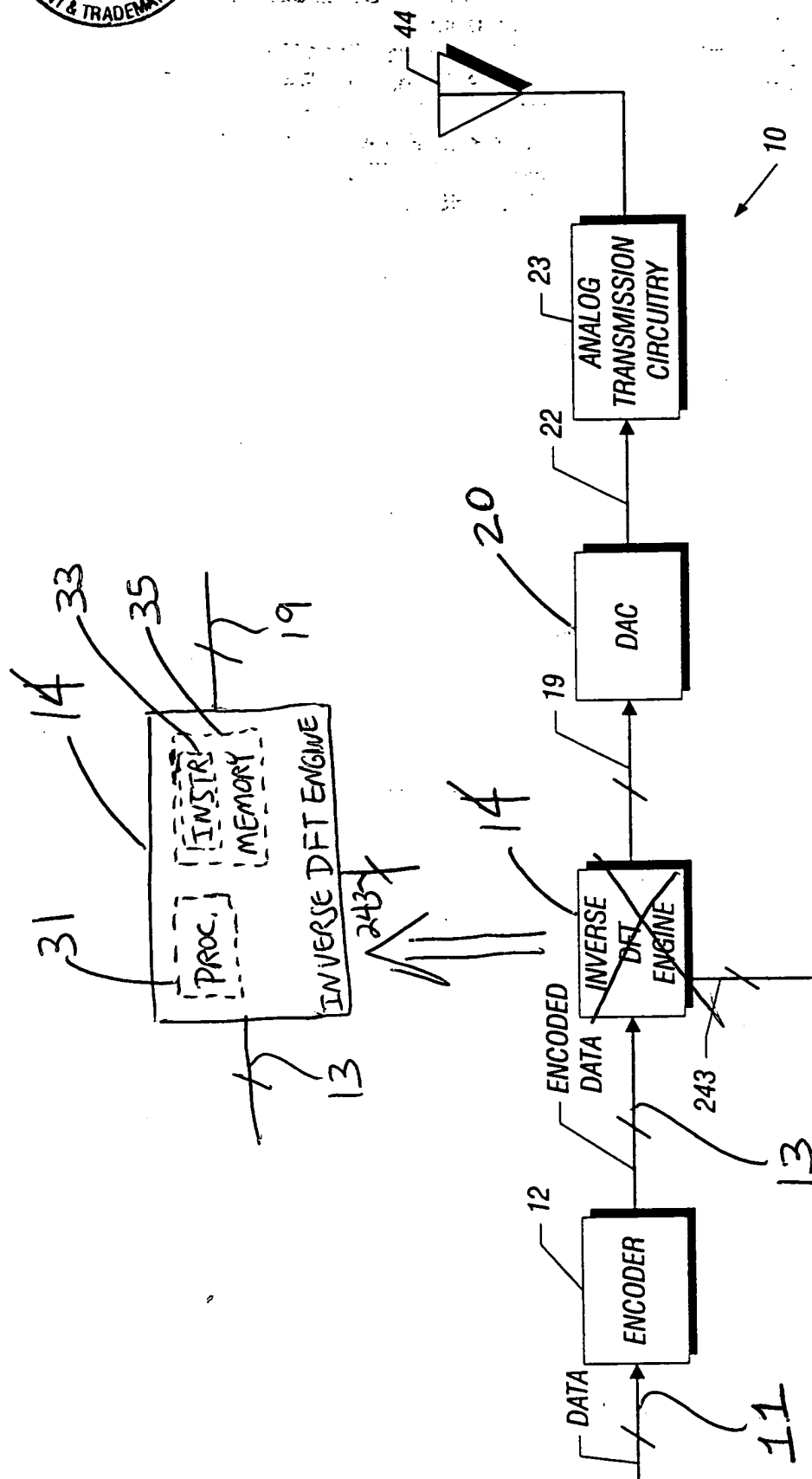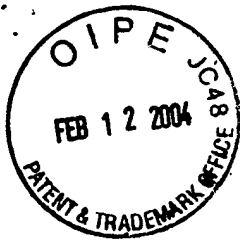Houston, TX 77024
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FIG. 1